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31 March 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: IDENTIFICATION, QUANTIFICATION, AND CHARACTERIZATION OF T CELLS AND T CELL ANTIGENS

(57) Abstract: Methods of quantifying and/or characterizing antigen-specific T cell populations, identifying T cell antigens and epitopes, and preparing targeted pharmaceutical compositions by (i) introducing a peptide into an antigen-presenting cell (APC) expressing a fusion protein comprising a major histocompatibility complex portion and a reporter peptide portion such that a complex forms between the fusion protein and the peptide and the peptide is displayed by the APC and (ii) contacting the APC with a population of cells, such that T cells in the population of cells that react with the peptide detectably internalize the complex; novel APCs useful in such methods; and related therapeutic and diagnostic methods.

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/08960

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12N 5/10; G01N 33/53, 33/566

US CL : 435/325, 372; 7.24, 7.1

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : C12N 5/10; G01N 33/53, 33/566

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0049302 A1 (CAI et al.) 25 April 2002, see entire document.	6-8,10-12,17-21,23, 24
Y		1-5,22,37-40,42-49
Y	US 6461867 B1 (CAI et al.) 8 October 2002, see entire document.	1-5,22,37-40,42-49

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

10 November 2004 (10.11.2004)

Date of mailing of the international search report

25 JAN 2005

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US04/08960

Continuation of B. FIELDS SEARCHED Item 3:  
WEST 2.1, MEDICINE/BIOTECH (compendium databases on DIALOG) search terms: author names, apc, transfect?, mhc, fusion, hla, report?, t cell?, internal?

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/08960

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 29-36  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
Claims 29-36 were not searched because claim 29 is indefinite because it refers to the method of claim 1 wherein claim 1 is not drawn to a method.
3. ☒ Claims Nos.: 9,13-16,25-28,41,50  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐  
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.